

What is claimed is:

- 1 1. A method of monitoring language understanding of a user's input
2 communication in an automated dialog system, comprising:
3 determining whether a probability of understanding the user's input
4 communication exceeds a first threshold, wherein if the first threshold is
5 exceeded, further dialog is conducted with the user.
- 1 2. The method of claim 1, wherein if the first threshold is not
2 exceeded, the user is routed to a human for assistance.
- 1 3. The method of claim 1, further comprising:
2 determining whether a probability of understanding the user's input
3 communication exceeds a second threshold, the second threshold being greater
4 than the first threshold, wherein if the second threshold is exceeded, further
5 dialog is conducted with the user using a current dialog strategy.
- 1 4. The method of claim 3, wherein if the second threshold is not
2 exceeded, further dialog is conducted with the user using an adapted dialog
3 strategy.
- 1 5. The method of claim 4, wherein the adapted dialog strategy
2 includes one of prompting the user with choices and prompting the user to
3 confirm the recognition and understanding data.
- 1 6. The method of claim 1, wherein the user's input communication
2 includes at least one of verbal and nonverbal communications.
- 1 7. The method of claim 6, wherein the nonverbal communications
2 include at least one of gestures, body movements, head movements, non-
3 responses, text, keyboard entries, keypad entries, mouse clicks, DTMF codes,
4 pointers, stylus, cable set-top box entries, graphical user interface entries, and
5 touchscreen entries.
- 1 8. The method of claim 1, wherein the method is used for customer
2 care purposes.
- 1 9. The method of claim 1, wherein the probability is determined using
2 recognition and understanding data derived from the user's input communication.

1 10. The method of claim 1, wherein the probability is determined using
2 training data stored in a training database, the training data including at least one
3 of classification models and extracted features.

1 11. The method of claim 10, wherein the extracted features are derived
2 from recognition, understanding and dialog data.

1 12. The method of claim 1, further comprising:
2 storing a first dialog exchange in a dialog history database, wherein
3 the first dialog exchange includes a first automated dialog output and the user's
4 first input communication and the further dialog conducted with the user results in
5 a second dialog exchange, wherein the second dialog exchange includes a
6 second dialog output and the user's second input communication; and
7 determining whether the probability of understanding exceeds the
8 first threshold using the first dialog exchange and the second dialog exchange.

1 13. The method of claim 12, wherein the method is recursive in that the
2 determining step determines whether the probability of exceeds the first
3 threshold using the each of the dialog exchanges conducted.

1 14. The method of claim 1, further comprising:
2 receiving the user's input communication;
3 recognizing portions of the user's input communication; and
4 providing an input to a language understanding monitor based on
5 applying a confidence function to the recognized portions of the user's input
6 communication.

1 15. A language understanding monitoring system that operates in an
2 automated dialog system, comprising:
3 a dialog manager that output dialog to the user;
4 a language understanding monitor that determines whether a
5 probability of understanding the user's input communication exceeds a first
6 threshold, wherein if the first threshold is exceeded, the language understanding
7 monitor prompts the dialog manager to conduct further dialog with the user.

1 16. The system of claim 15, wherein if the first threshold is not
2 exceeded, the language understanding monitor prompts the dialog manager to
3 route the user to a human for assistance.

1 17. The system of claim 15, wherein the language understanding
2 monitor determines whether a probability of understanding the user's input
3 communication exceeds a second threshold, the second threshold being greater
4 than the first threshold, and if the second threshold is exceeded, the language
5 understanding monitor prompts the dialog manager to conduct further dialog with
6 the user using a current dialog strategy.

1 18. The system of claim 17, wherein if the second threshold is not
2 exceeded, the language understanding monitor prompts the dialog manager to
3 conduct further dialog with the user using an adapted dialog strategy.

1 19. The system of claim 18, wherein the adapted dialog strategy
2 includes one of prompting the user with choices and prompting the user to
3 confirm the recognition and understanding data.

1 20. The system of claim 15, wherein the user's input communication
2 includes at least one of verbal and nonverbal communications.

1 21. The system of claim 15, wherein the system is used for customer
2 care purposes.

1 22. The system of claim 15, wherein the language understanding
2 monitor determines the probability using recognition data provided by a
3 recognizer and understanding data provided by a language understanding unit,
4 and the recognition and understanding data is derived from the user's input
5 communication.

1 23. The system of claim 15, further comprising a training database for
2 storing training data for language understanding, wherein the language
3 understanding monitor determines the probability using the training data stored in
4 the training database, the training data including at least one of classification
5 models and extracted features.

1 24. The system of claim 23, wherein the extracted features are derived
2 from recognition, understanding and dialog data.

1 25. The system of claim 15, further comprising:
 2 a dialog history database that stores a first dialog exchange,
 3 wherein the first dialog exchange includes a first automated dialog output and the
 4 user's first input communication, and the further dialog conducted with the user
 5 results in a second dialog exchange, the second dialog exchange including a
 6 second dialog output and the user's second input communication, and the
 7 language understanding monitor determining whether the probability of
 8 understanding exceeds the first threshold using the first dialog exchange and the
 9 second dialog exchange.

1 26. The system of claim 25, wherein the language understanding
 2 monitor determines whether the probability of understanding exceeds the first
 3 threshold using the each of the dialog exchanges conducted.

1 27. The system of claim 15, further comprising:
 2 a recognizer that recognizes the user's input communication; and
 3 a language understanding unit that applies a confidence function to
 4 the recognized portions of the user's input communication and provides an input
 5 to the language understanding monitor.

1 28. A method of monitoring language understanding of a user's input
 2 communication in an automated dialog system, comprising:
 3 determining whether a probability of understanding the user's input
 4 communication exceeds a first threshold, wherein if the first threshold is
 5 exceeded, further dialog is conducted with the user, otherwise, the user is routed
 6 to a human for assistance;
 7 determining whether a probability of understanding the user's input
 8 communication exceeds a second threshold, the second threshold being greater
 9 than the first threshold, wherein if the second threshold is exceeded, further
 10 dialog is conducted with the user using a current dialog strategy, otherwise
 11 further dialog is conducted with the user using an adapted dialog strategy.